

Region 6 Analysis of the Chloroprene Ambient Network Data

Topic: Discussion of previous and ongoing analysis of ambient monitoring data collected at the sites surrounding Denka Performance Elastomers (DPE) in LaPlace, Louisiana.

Background:

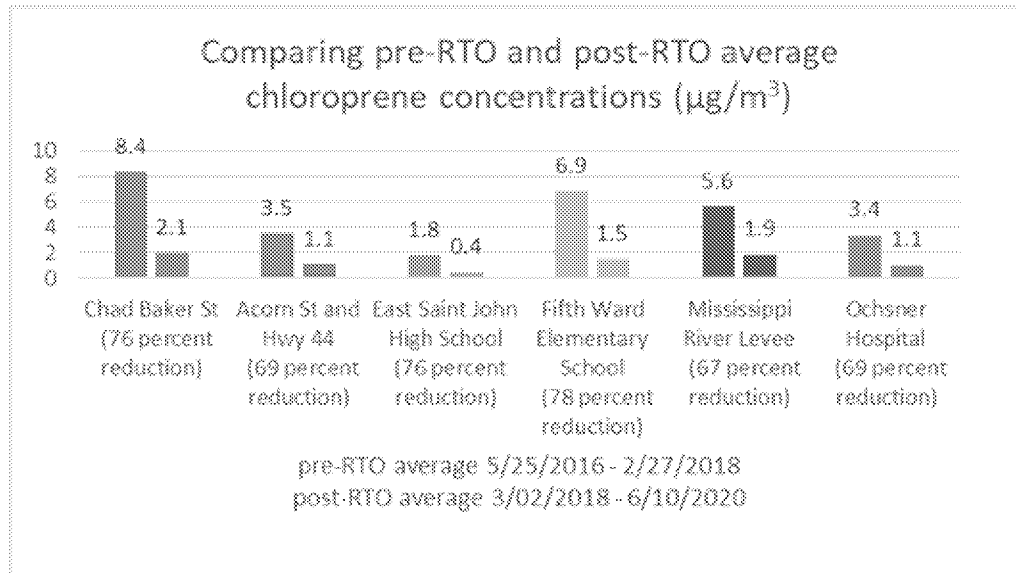
- NESHAP for Group 1 Polymers and Resins (40 CFR Part 63, Subpart U) - September 1996, Risk and Technology Review – December 2008
 - Risks found to be “acceptable” based on health information at that time, absent of chronic cancer risk from chloroprene
 - IRIS assessment was completed in 2010 for chloroprene. The assessment identified chloroprene as a “likely human carcinogen” and provided a URE
 - Subsequently, the 2011 National Air Toxic Assessment (released in 2015) indicated potential elevated risks in the census tracts surrounding the DPE
- Public and political concern – many news articles and TV segments
- Public meetings in LaPlace with Louisiana Dept of Environmental Quality (LDEQ), State health officer, Parish president and council, school board, public safety, etc.
- Community ambient air monitoring (TO-15 canisters) at six locations surrounding DPE commenced in May 2016 (1-in-3 days through Feb 2019, 1-in-6 days Mar 2019 to present)



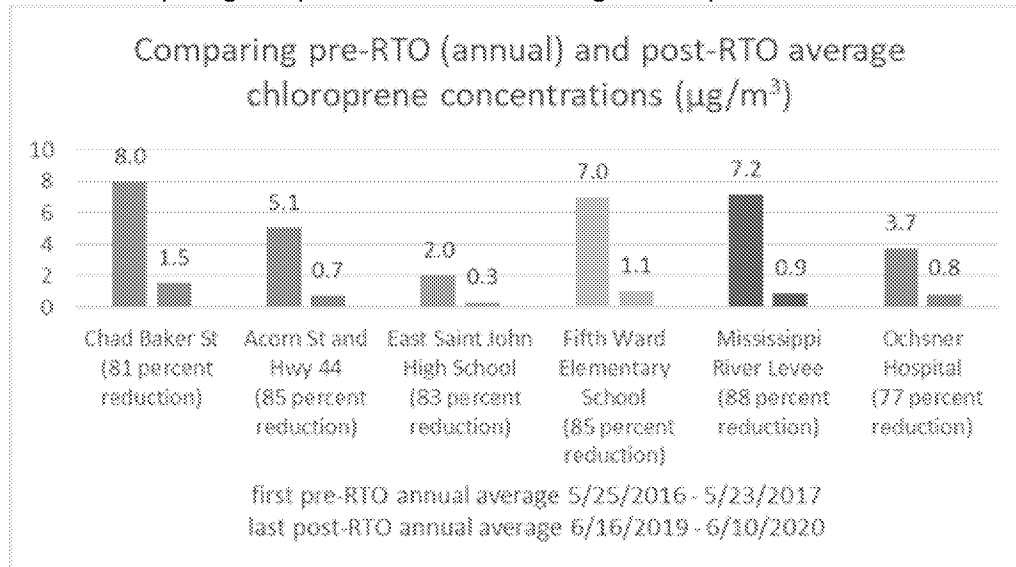
Figure of monitoring locations. Green = EPA Community. Blue = EPA Spod. Fuchsia = DPE

- DPE signs Administrative Order on Consent with LDEQ
 - DPE-operated monitors also record ambient concentrations since October 2016 (Alternating 1-in-4 day and 1-in-5 day frequency. Week 1: Monday, Friday. Week 2: Wednesday. Repeat.)
 - Initiative to reduce plant emissions by 85 percent from 2014 baseline
 - New emission controls for the neoprene manufacturing processes

- Route additional chloroprene vent streams to newly installed RTO and existing hydrochloric acid production furnace
- Installations complete in early 2018
- In a May 2020 response to DPE, LDEQ determined that an 85% (84.63% rounded) reduction in chloroprene emissions was achieved from the 2014 reported emissions
- Community ambient air monitoring at six locations continue to date (based on funding from OAR)
 - Reduction in post-control mean concentration:
 - Comparing averages during entire pre-control and post-control periods: of 67 – 78%



- Comparing first pre-control annual average to last post-control annual average: 77 – 88%



- Community ambient air monitoring scheduled to end Summer 2020 – awaiting decision on whether monitoring will be extended

- OECA/Region 6 Enforcement deployed SPod-triggered TO-15 canisters at 4 existing community monitoring locations in March 2020. EPA and contractors resolved access to the DuPont owned locations at Levee and Acorn/Hwy 44. On July 1, 2020 two of EPA's six SPods were relocated to the Levee and Acorn/Hwy 44 community monitoring locations.

Ex. 5 Deliberative Process (DP)

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- Summary:** Robert Imhoff (Region 6) has been responsible for the modeling efforts and statistical analysis of the ambient monitoring data. His comparison of the modeled and observed data from 2016-18 identified the potential distributions and performed a rough mass balance estimate for the relative emission rates from known routine emissions, unknown routine emissions, and episodic emissions. This analysis has also been used by Region 6 Enforcement in their deployment of SPods in an effort to determine the suitability of these locations and to assist in evaluating the relative concentration measured using these devices. The following highlights are a summary of the work performed by Region 6 and general comments from OAQPS Staff

Community Monitoring

- Monitoring data supports about a 2/3 reduction in chloroprene emissions, since installation of RTO
 - Annual average driven by "episodic peaks"
 - Significant emission episodes identified in about 10% of the sampling days
 - The estimated daily emission rate on days with intermittent events is about 4X the routine rate. Averaged over a year, due to the additional intermittent emissions, the overall rate is about double that from the routine sources alone
- Modeling efforts identify a majority of peak episodic concentrations during nighttime hours
 - Potential for a nighttime atmospheric boundary level condition (low mixing depth and light winds)
 - Modeling data indicates impacts from elevated point sources most likely not contributing to peak episodes

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Ex. 5 AC / Ex. 7(A)

SPod Monitoring

- Modeling effort initially performed to inform an in-plant network of SPods
- Additional efforts made to evaluate suitability of the existing community monitoring locations, after

Ex. 7(A)

- SPods deployed in March 2020 at 4 of 6 community monitoring sites
 - As of July 1, 2020, SPods are operating at all community air monitoring sites
- Data evaluation efforts are limited by the amount of available data
 - SPods have confirmed increases in VOC concentration during the night
 - As of June 22, there have been two (April 11 and April 17) occurrences of community monitoring results greater than 10 µg/m³. On these dates, the SPods did not trigger canister collections. However, the information collected is being used to alter the data processing firmware and software algorithms used to trigger canisters to potentially avoid missing similar chloroprene

events. This SPod triggering modification needs to be completed and tested, prior to understanding how well it will perform

- There has been one date where the SPods have collected a canister sample at the same location and time as the community monitoring (April 22). The results are consistent (0.207 $\mu\text{g}/\text{m}^3$ SPod triggered canister and 0.205 $\mu\text{g}/\text{m}^3$ community)

- **Path forward**

Ex. 7(A)

- Continued use of existing and/or alternative SPod triggered approach to better understand the frequency of these events